

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-12 (cancelled).

13 (new). A process for producing a biodegradable fibre-reinforced shaped composite comprising providing a shaped preform of reinforcing fibres in a mould or tool, introducing into the tool or mould containing the preform a composition comprising monomers, co-monomers, oligomers or resin of a polymer matrix, and partially or substantially polymerising the composition to form a polymer in the mould or tool.

14 (new). A process according to Claim 13 wherein the fibres in the preform have a predetermined regular, irregular or profiled fibre distribution, orientation and/or fraction.

15 (new). A process according to Claim 14 wherein the distribution, orientation and/or fraction of the fibres in the fibre preform is retained on introduction of the composition into the mould or tool.

16 (new). A process according to Claim 13 wherein the polymer and the fibres are selected to have different biodegradation rates.

17 (new). A process according to Claim 13 wherein the polymer is selected from the group consisting of polymers and copolymers of aliphatic polyesters.

18 (new). A process according to Claim 17 wherein the polymer comprises poly- ϵ -caprolactone.

19 (new). A process according to Claim 13 wherein the fibre reinforcement is selected from the group consisting of:

- (a)ceramics;
- (b)bioglasses;
- (c)mixtures of silica, sodium oxide, calcium oxide and phosphorus pentoxide; and
- (d)polymers and co-polymers of aliphatic polyesters.

20 (new). A process according to Claim 13 wherein the polymer is a thermoplastic polymer.

21 (new). A process according to Claim 13 wherein the fibres of the preform are continuous or long fibres.

22 (new). A process according to Claim 13 wherein the fibres are long continuous fibres which are 10^2 - 10^4 times greater in length than diameter.

23 (new). A process according to Claim 13 wherein the polymer impregnates the fibres of the preform.

24 (new). A biodegradable fibre-reinforced shaped composite obtained by the process of providing a shaped preform of reinforcing fibres in a mould or tool, introducing into the tool or mould containing the preform a composition comprising monomers, co-monomers, oligomers or resin of a polymer matrix, and partially or substantially polymerising the composition to form a polymer in the mould or tool.

25 (new). A medical implant comprising a biodegradable fibre-reinforced shaped composite according to Claim 24.

26 (new). A medical implant comprising a biodegradable fibre-reinforced shaped composite according to Claim 25 suitable for surgical reconstruction.

27 (new). A medical implant according to Claim 26 wherein the surgical reconstruction is selected from the group consisting of cranial, maxillofacial and orthopaedic surgical reconstruction.

28 (new). A biodegradable fibre-reinforced shaped composite according to Claim 24 wherein the polymer and the fibres display differential rates of biodegradation.

29 (new). A biodegradable fibre-reinforced shaped composite according to Claim 28 wherein the differential rates of biodegradation are a function of the nature of the material or the molecular weight thereof.

30 (new). A biodegradable fibre-reinforced shaped composite according to Claim 28 wherein in use the polymer and/or fibre biodegrade via an intermediate comprising a residual porous polymer form or a residual fibre form respectively with voids suitable for primary growth of cells.

31 (new). A biodegradable fibre-reinforced shaped composite according to Claim 30 wherein the voids are suitable for the growth of cells selected from the group consisting of bone, cartilage, muscle and vascular cells.

32 (new). A biodegradable fibre-reinforced shaped composite according to Claim 28 wherein in use the polymer and/or fibre biodegrade via an intermediate comprising a residual porous polymer form or a residual fibre form respectively providing a residual scaffold for attachment and growth of cells.

33 (new). A biodegradable fibre-reinforced shaped composite according to Claim 34 wherein the scaffold allows attachment and growth of cells selected from the group consisting of bone, cartilage, muscle and vascular cells.

34 (new). A biodegradable fibre-reinforced shaped composite according to Claim 24 wherein the shape of the composite is selected from the group consisting of a pin, a plate, a mesh, a screw, a rivet and a custom implant.

35 (new). A biodegradable fibre-reinforced shaped composite according to Claim

24 wherein the composite is coated with, associated with, impregnated with or embedded therein with a therapeutic agent.

36 (new). A process according to Claim 13 wherein the mould or tool comprises a 3-dimensional template of a 3-dimensional image of a selected feature or area of a patient for implant.

37 (new). A process according to Claim 36 wherein the mould or tool is provided by

(a) medical imaging of a selected feature or area of a patient complementary to or symmetrical with a feature or area to be replaced or reconstructed to obtain data comprising a plurality of co-ordinates defining a 3-dimensional image;

(b) passing the data collected from medical imaging to a translating system which interprets said data and generates information for transferring said data to a rapid prototyping system suitable for generating a mould or tool.

38 (new). A process for producing a biodegradable fibre-reinforced shaped composite comprising providing a shaped preform of reinforcing fibres in a mould or tool, injecting into the tool or mould containing the preform a composition comprising monomers, co-monomers, oligomers or resin of a polymer matrix, and partially or substantially polymerising the composition to form a polymer in the mould or tool.

39 (new). A process for producing a biodegradable fibre-reinforced shaped

composite comprising providing a shaped preform of reinforcing fibres with predetermined regular, irregular or profiled fibre distribution, orientation and/or fraction in a mould or tool, injecting into the tool or mould containing the preform a composition comprising monomers, co-monomers, oligomers or resin of a polymer matrix, retaining the distribution, orientation and/or fraction of the fibres in the fibre preform, and partially or substantially polymerising the composition to form a polymer in the mould or tool.

40 (new). A process for producing a biodegradable fibre-reinforced shaped composite by means of resin injection transfer moulding comprising providing a shaped preform of reinforcing fibres with predetermined regular, irregular or profiled fibre distribution, orientation and/or fraction in a mould or tool, injecting into the tool or mould containing the preform a composition comprising monomers, co-monomers, oligomers or resin of a polymer matrix, retaining the distribution, orientation and/or fraction of the fibres in the fibre preform, and partially or substantially polymerising the composition *in situ* in the mould or tool to form a shaped composite.